

Amphipoda from the East Coast of India—2

Gammaridea and Caprellidea

BY

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(With eight text-figures)

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Genus *Parhyale* Stebbing

Parhyale hawaiiensis (Dana)

(Fig. 5)

Allorchestes hawaiiensis Dana, 1853-55, p. 900, pl. 61, fig. 5 ; Bate, 1862, p. 47, pl. 8, fig. 1.

Hyale hawaiiensis Stebbing, 1906, p. 573 ; Schellenberg, 1938 (a), p. 66, fig. 34 ; Ruffo, 1950, p. 57.

Parhyale hawaiiensis Shoemaker, 1956, p. 349, figs. 3-4 ; Ruffo, 1959, p. 17.

Hyale nilssoni Walker, 1904, p. 238 ; 1905, p. 925, fig. 140 (1).

Hyale brevipes Chevreux, 1901, p. 400, figs. 15-18 ; Walker, 1909, p. 337 ; Chilton, 1921, p. 545, fig. 9 ; 1925, p. 536 ; Schellenberg, 1928, p. 658 ; Barnard KH, 1935, p. 292.

Material : Tuticorin : 3 males and 4 females from under seaweeds washed ashore. Ennore estuary : 3 males and 2 females from Enteromorpha weeds. Irakam Island, Pulicat Lake : 3 males from mud pools.

Length : 7 mm.

Remarks : The present specimens are the same as those recorded as *H. brevipes* by Walker (1904, 1905, 1909), Chilton (1921, 1925) and Barnard (1935). Following Schellenberg (1938) and Shoemaker (1956), these specimens are referred to this species though they do not fully agree with its description.

The specimens are characterised by the short and plumpy antennae, gnathopods and pereopods. Eyes are dark, rounded or reniform. Antenna 1, $\frac{3}{4}$ as long as antenna 2, flagellum with 8-9 joints. Antenna 2, $\frac{1}{5}$ as long as body, flagellum with 8-12 joints. Mouth parts

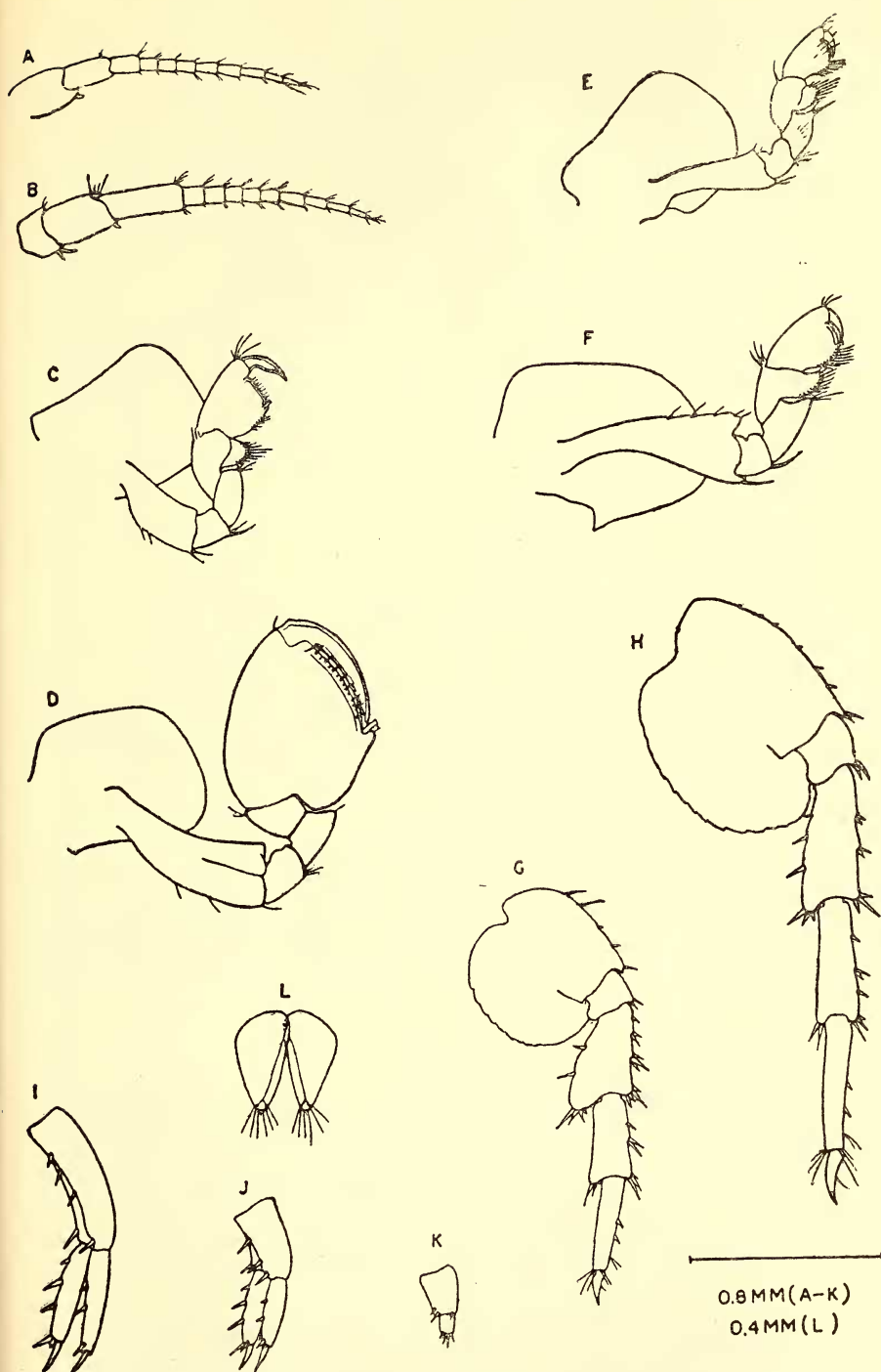


FIG. 5. *Parhyale hawaiiensis* (Dana). Male: A, antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2; G, peraeopod 3; H, peraeopod 5; I, uropod 1; J, uropod 2; K, uropod 3; L, telson. Female: E, gnathopod 1; F, gnathopod 2.

typical of the genus. Gnathopod 1 of male : Side plate quadrate, other joints short and plumpy. Palm straight, at right angle with the hind margin. Dactylus aquiline. Gnathopod 2 of male : 6th joint broadly oval, palm oblique, evenly convex. Gnathopod 1 of female : 5th joint convex in front, hind lobe distinct. 6th joint rectangular, setose hind margin cut off from the palm. Gnathopod 2 of female : 6th joint widening distally, setose hind margin continuous with the palm. Dactyli of peraeopods short, with a stout seta on inner margin. Peraeopod 4 with 2 sets of setae on hind margin of 6th joint. Peraeopod 5 : Hind margin of 2nd joint distinctly serrate and that of 6th joint with 3 sets of setae including the terminal one. Uropod 1 : Peduncle much longer than rami, without a stout distal spine. Uropod 3 : Peduncle more than twice as long as outer ramus, with a minute inner ramus (not noticed previously in Indian specimens). Telson somewhat long, lobes triangular.

Distribution : Nearly cosmopolitan.

Parhyale inyacka (Barnard)

(Fig. 6)

Hyale inyacka Barnard KH, 1916, p. 233, pl. 28, fig. 4 ; Chevreux, 1925, p. 370, fig. 17 ; Stephensen, 1928, p. 590 ; 1933 (b), p. 441, figs. 3-4.

Parhyale inyacka Barnard KH, 1940, p. 472 ; Stephensen, 1948, p. 6 ; Barnard JL, 1955, p. 23, fig. 12.

Hyale hawaiiensis Nayar, 1959, p. 30, pl. 10, figs. 10-24.

Material : Hare Island : Several specimens from seaweeds. Tuticorin : Several specimens from under stones and rotting weeds on the shore. Kilakkarai : Several specimens from under stones on the shore along with *Orchestia anomala*. Rameswaram : Several specimens from algae.

Length : 14 mm.

Remarks : These specimens are provisionally referred to this species as there is considerable confusion between this species and *P. hawaiiensis*. Shoemaker (1956), in his review of the genus, united *P. inyacka* with *P. hawaiiensis* but it was not accepted by Bulychева (1957) who kept them separate. These specimens, however, closely agree with the description and figures of *P. inyacka* given by Barnard KH (1916, 1940), Stephensen (1933), and Barnard JL (1955).

These specimens are characterised by the following features : Eyes dark, elongate oblong (in terrestrial specimens) or reniform (in aquatic specimens). Antenna 1, $\frac{1}{2}$ as long as body, flagellum with 12-15 joints. Antenna 2 half as long as body, flagellum with 24-30 joints.

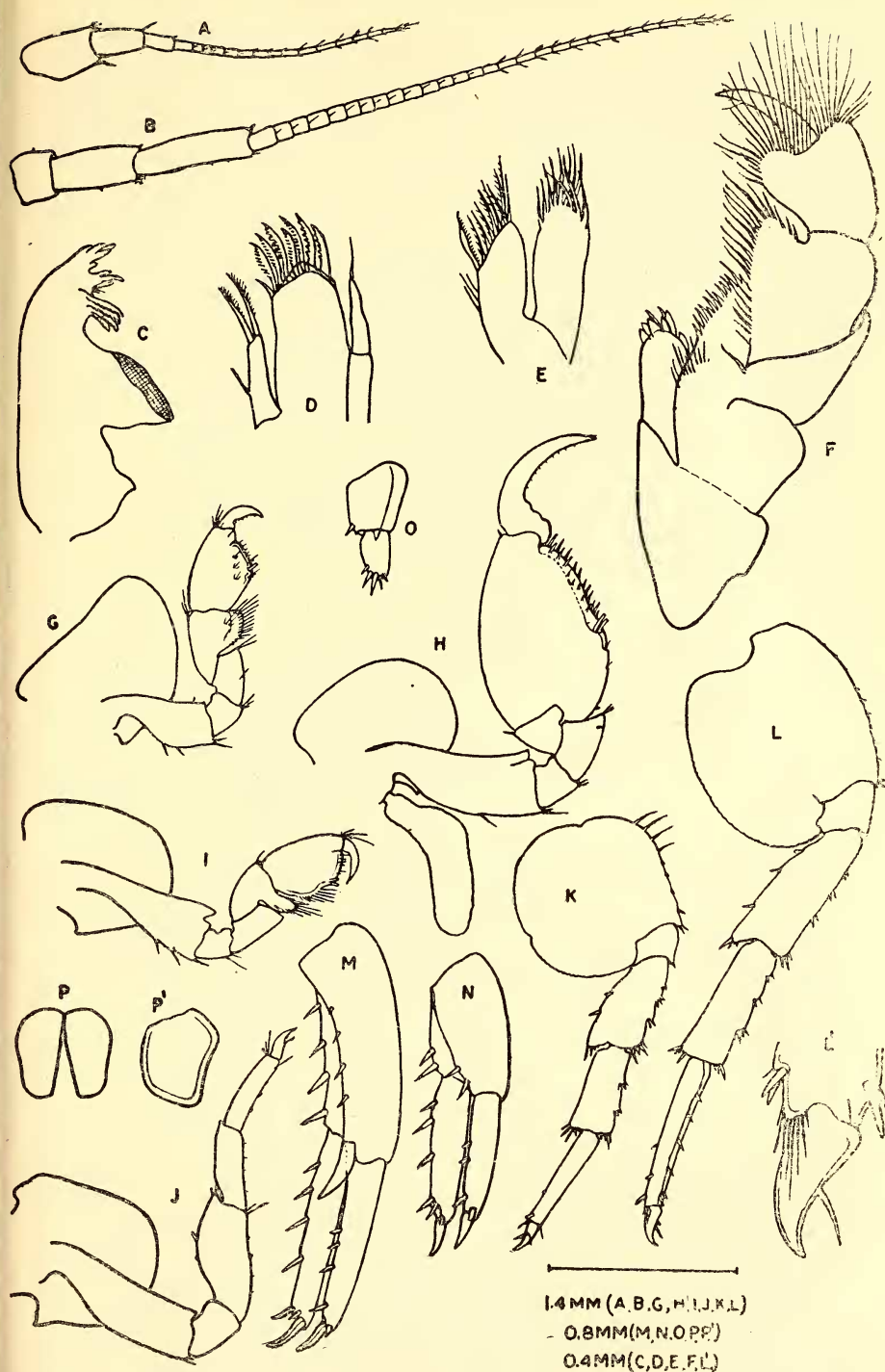


FIG. 6. *Parhyale inyacka* (Barnard). Male : A, antenna 1; B, antenna 2; C, mandible; D, maxilla 1; E, maxilla 2; F, maxilliped; G, gnathopod 1; H, gnathopod 2; J, peraeopod 1; K, peraeopod 3; L, peraeopod 5; L', dactylus of peraeopod 5 enlarged; M, uropod 1; N, uropod 2; O, uropod 3; P, dorsal view of telson; P', side view of telson. Female : I, gnathopod 2.

Gnathopod 1 of male : Side plate rounded below, other joints long and not plumpy. Palm slightly oblique. Dactylus aquiline. Gnathopod 2 of male : 6th joint elongate oval in form, palm very oblique, slightly convex. Gnathopod 2 of female similar to the previous but larger. 6th joint elongate, proximal $\frac{2}{3}$ of hind margin produced, with strong setae. Palm slightly oblique, defined by 2 spines. Dactyli of peraeopods short, with a strong seta on inner margin. Peraeopod 3 : Hind margin of 2nd joint finely serrate, with a marked indent in the middle. Peraeopod 4 : with 3 sets of spines and setae on hind margin of 6th joint. Peraeopod 5 : Hind margin of 2nd joint faintly serrate. 4 sets of spines and setae on hind margin of 6th joint. Uropod 1 : Peduncle slightly longer than the rami, with a stout distal spine. Uropod 3 : Peduncle slightly longer than outer ramus. Inner ramus small, distinct. Telson lobes elongate, rounded behind.

Distribution : St. Thomas, Bonaire, Canary Islands, Senegal, Cameroons, South Africa, Hawaii Islands. This is the first record of this species from India.

Family PHOTIDAE

Genus *Audulla* Chevreux

Audulla chelifera Chevreux

(Fig. 7)

Audulla chelifera Chevreux, 1901, p. 432, figs. 56-65 ; Walker & Scott, 1903, p. 225, pl. 14B, fig. 2 ; Stebbing, 1906, p. 737.

Material : Cape Comorin : 1 young male from algae. Pamban : 3 males and 3 females from seaweeds growing on rocks below the railway bridge.

Length : 4.5 mm.

Description : *Male* : Body slender, 1st segment is the shortest, 3rd pleosome the longest. Urosome depressed. Head as long as first two segments. Eyes medium-sized, dark, oval, ocular lobe conically produced between 1st and 2nd antennae. Side plates small, rounded.

Antennae subequal, half as long as body, fringed with long setae. Antenna 1 : 1st joint of peduncle as long as 3rd but stouter. 2nd joint $1\frac{1}{2}$ times as long as 1st. Flagellum twice as long as 3rd joint of peduncle, with 9-11 joints. Accessory flagellum 4-5 jointed. Antenna 2 : 5th joint of peduncle as long as 4th. Flagellum longer than last joint of peduncle, with 9 joints. Mouth parts normal.

Gnathopod 1 : Side plate small, rhomboidal. 2nd joint stout, widening distally. 4th joint twice as long as 3rd. 5th and 6th joints subequal in length, their hind margin with long setae. Palm oblique, straight, undefined. Dactylus as long as palm, swollen at the middle and serrate on inner margin. Gnathopod 2 : Side plate rounded. 2nd joint stout and longer than next three combined. 5th joint triangular, hind lobe with long setae. 6th joint large, oblong ; front and hind margins paral-

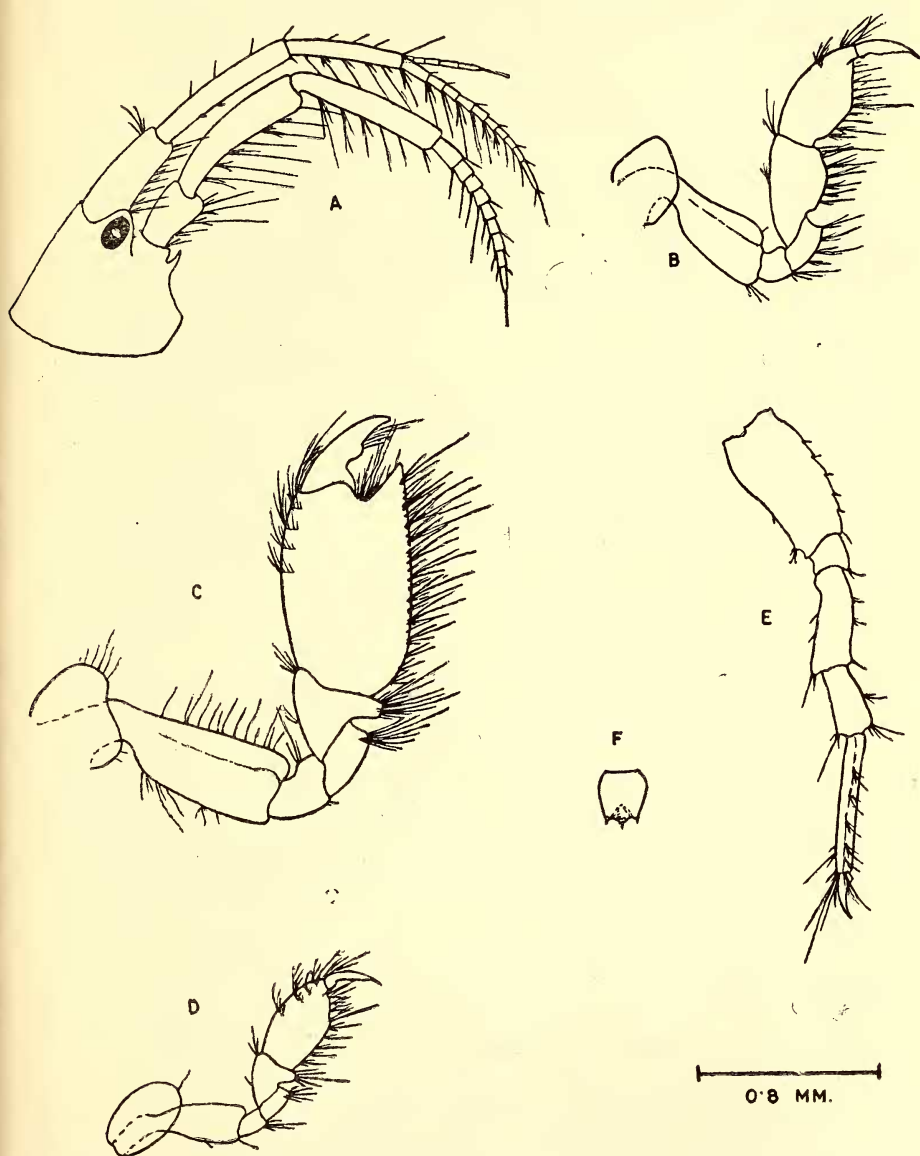


FIG. 7. *Audulla chelifera* Chevreux. Male : A, head ; B, gnathopod 1 ; C, gnathopod 2 ; E, pereopod 5 ; F, telson. Female : D, gnathopod 2.

lel ; hind margin fringed with long setae, distally produced into a pointed tooth to meet the tip of dactylus so that the gnathopod is truly chelate. Dactylus short and stout, swollen at the base, followed by a depression and a rounded tooth on lower margin ; it has the form of a parrot's upper beak.

Peraeopods 1 and 2 identical. Peraeopods 3-5 similar, increasing in length. Peraeopod 5 : 2nd joint narrow, rectangular, front margin with 6 spinules. Dactylus thick. Uropods 1 and 2 : Peduncle subequal to inner ramus which is longer than outer. Uropod 3 : Peduncle as long as rami. Telson : Semitubular with a depression dorsally ; distally forming 3 lobes each with a spine.

Female : Gnathopod 1 as in male but smaller. Gnathopod 2 : Smaller than in male. Side plate oval. 2nd joint stout, as long as next three combined. 6th joint oblong, twice as long as 5th ; palm half as long as hind margin, oblique, slightly convex ; long setae on hind margin of joints 4-6. Dactylus long and slender, inner margin serrate.

Remarks : This species, originally described under the family Ischyroceridae, was transferred to Photidae by Walker & Scott (1903). The present material closely agrees their description but the 6th joint of gnathopod 2 of female is not so broad as in their figure.

Distribution : Seychelles Islands, Abd-el-Kuri Island. This species is recorded for the first time in India.

Genus *Photis* Kroyer

Photis digitata Barnard

Photis longicaudata Chilton, 1921, p. 554, fig. 12 (*not* Bate & Westwood).

Photis digitata Barnard KH, 1935, p. 302 ; Nayar, 1959, p. 35, pl. 12, figs. 18-24.

Material : Porto Novo : 2 females from a gastropod shell. Kovelong : 1 female from rock oyster. Madras, Adyar : 4 females from filamentous algae in the estuary. Ennore estuary : Several specimens from oyster rafts. Visakhapatnam harbour : 1 female from wooden rafts.

Length : 4 mm.

Distribution : India.

Photis longicaudata (Bate & Westwood)

Eiscladus longicaudata Bate & Westwood, 1863, p. 412.

Photis longicaudata Sars, 1895, p. 571, pl. 203, fig. 1 ; Walker, 1901, p. 306 ; 1904, p. 286, pl. 6, fig. 43 ; 1909, p. 339 ; Stebbing, 1906, p. 608 ; Chevreux, 1911, p. 249 ; Barnard KH, 1916, p. 243 ; 1937, p. 164 ; Schellenberg, 1926 (a), p. 231 ; 1928, p. 662 ; Shoemaker, 1945, p. 11, fig. 5 ; Nayar, 1959, p. 34, pl. 12, figs. 1-7.

Material : Devipattinam : 2 males from a Murex shell.

Length : 4 mm.

Distribution : Cosmopolitan.

***Photis longimanus* Walker**

(Fig 8)

Photis longimanus Walker, 1904, p. 286, pl. 7, fig. 44 ; Schellenberg, 1925, p. 175 ;
Barnard KH, 1916, p. 244, 1940, p. 479.

Material : Pamban : 7 males and 5 females from seaweeds.

Length : 3 mm.

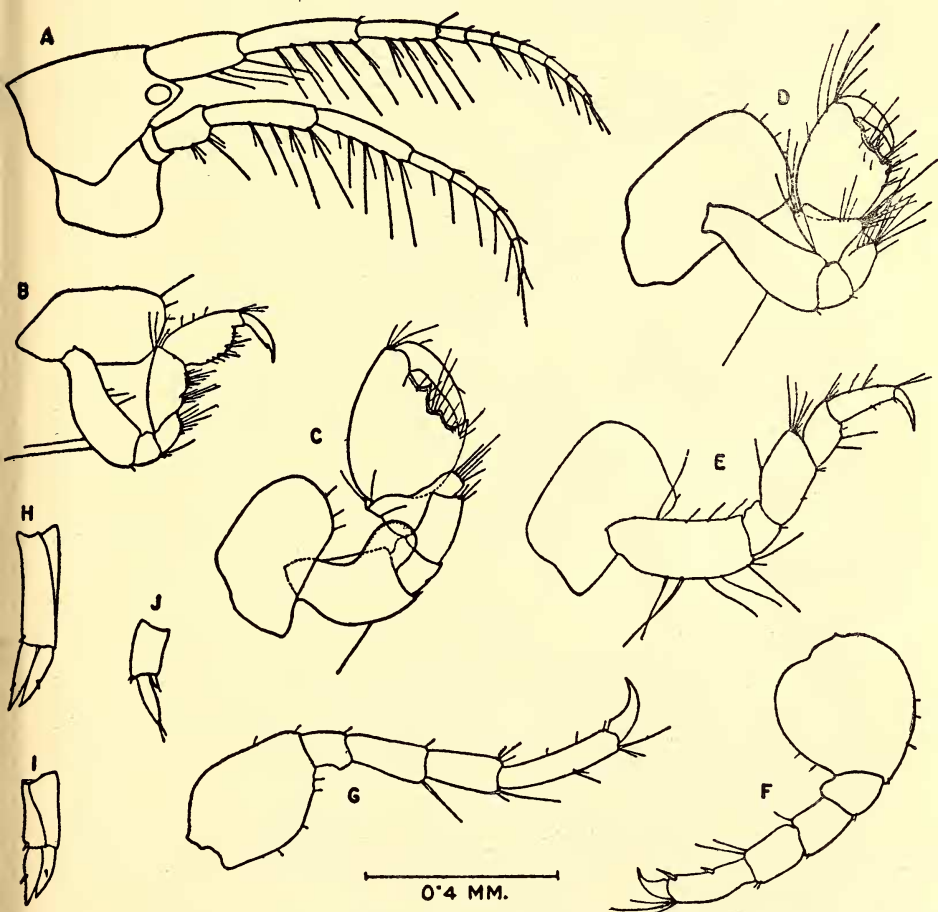


FIG. 8. *Photis longimanus* Walker. Male : A, head ; B, gnathopod 1 ; C, gnathopod 2 ; E, peraeopod 1 ; F, peraeopod 3 ; G, peraeopod 5 ; H, uropod 1 ; I, uropod 2 ; J, uropod 3. Female : D, gnathopod 2.

Remarks : These specimens, also collected from the Gulf of Mannar like Walker's (1904) material, closely agree with his description and figures and need no detailed description. The male gnathopods are, however, a little different. Moreover females were not observed by Walker.

Male : Gnathopod 1 : 2nd joint longer than 4th and 5th joints and stouter than 6th. 5th joint as long and wide as 6th, hind margin with two distinct tufts of setae. Palm narrow, undefined. Dactylus with a subterminal tooth on inner margin. Gnathopod 2 : 2nd joint, front margin produced into a large, humplike process. The 3 teeth on palm are more strongly developed. **Female :** Gnathopod 1 as in male. Gnathopod 2 large as in male. 2nd joint without the humplike process, 5th joint not short, triangular, hind lobe not produced. 6th joint as in male, but the palmar teeth and the concave spaces in between are poorly developed.

Distribution : South Africa, Ceylon. This is the first record of this species from India.

Genus *Eurystheus* Bate

Eurystheus afer (Stebbing)

(Fig. 9)

Gammaropsis afra Stebbing, 1888, p. 1097, pl. 113.

Eurystheus afer Stebbing, 1906 ; p. 612, 1908 (a), p. 87 ; 1910, p. 461 ; Schellenberg, 1928, p. 662 ; Barnard KH, 1916, p. 249, pl. 28, fig. 11 ; 1937, p. 165, fig. 12 ; 1940, p. 479 ; Pillai, 1957, p. 55, fig. 13 (1-4).

Protomedeia ? afra Della Valle, 1893, p. 440.

Material : Rameswaram : 1 male from algae. Pamban : 2 males from seaweeds.

Length : 5 mm.

Remarks : These specimens closely agree with the description and figures of Barnard (1937) and Pillai (1957). This species differs from *E. atlanticus* (Stebbing) in the structure of the ocular lobes and the male gnathopod 2.

Distribution : South Africa, Gulf of Suez and Bagamoyo, Zanzibar and India. This species is recorded for the first time from the east coast of India.

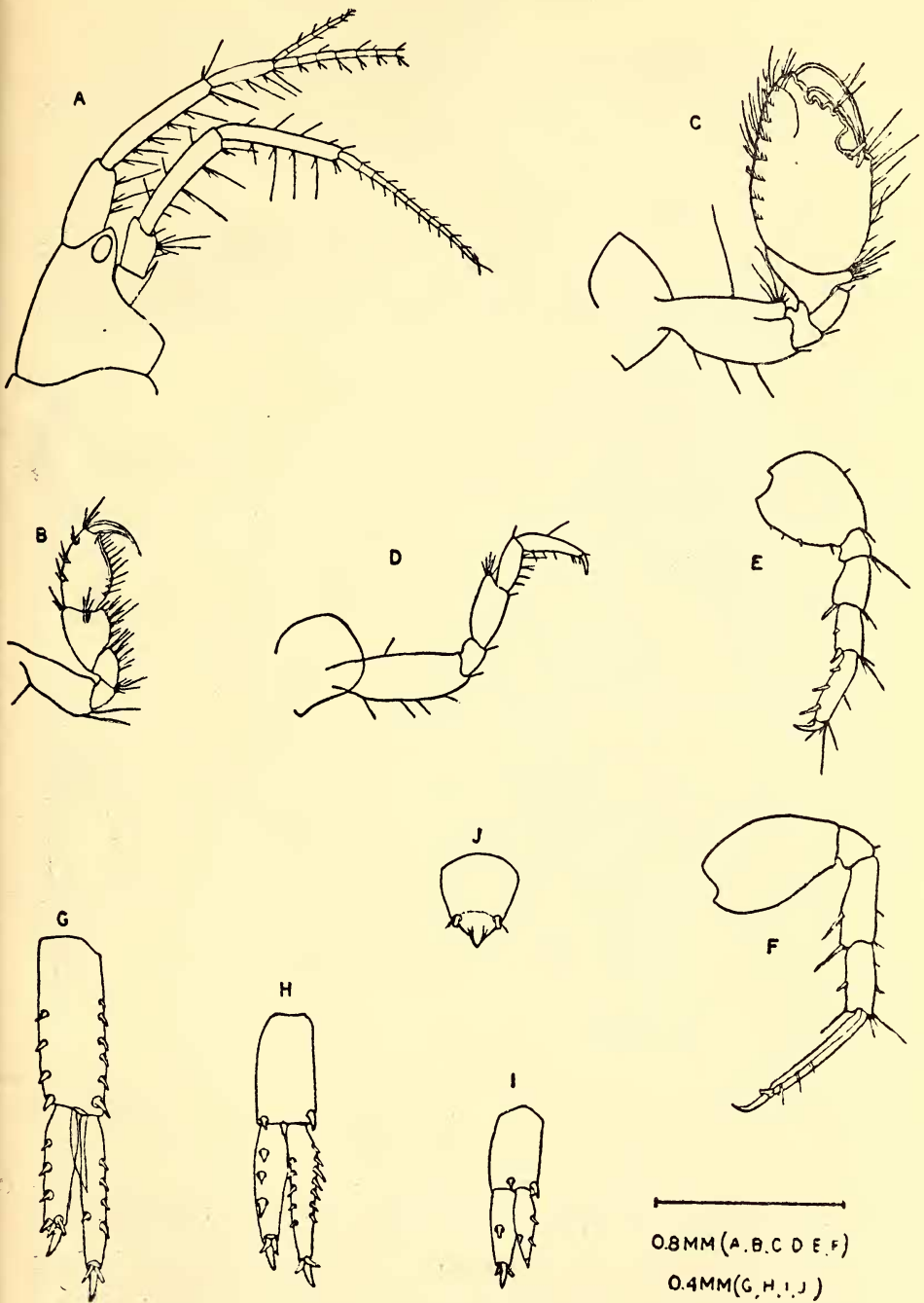


Fig. 9. *Eurystheus afer* (Stebbing). Male: A, head; B, gnathopod 1; C, gnathopod 2; D, peraeopod 1; E, peraeopod 3; F, peraeopod 5; G uropod 1; H, uropod 2; I, uropod 3; J, telson.

Eurystheus digitatus Schellenberg

(Fig. 10)

Eurystheus digitatus Schellenberg, 1938 (a), p. 84, figs. 44 a-f.

Material : Kilakkarai : 1 female from seaweeds. Pamban : 12 males and 12 females from seaweeds below the railway bridge.

Length : 5 mm.

Remarks : The present material is strikingly similar to the description and figures of Schellenberg (1938). The oblique, stridulating palm of gnathopod 1 and the rectangular 6th joint with a long, spurlike pro-

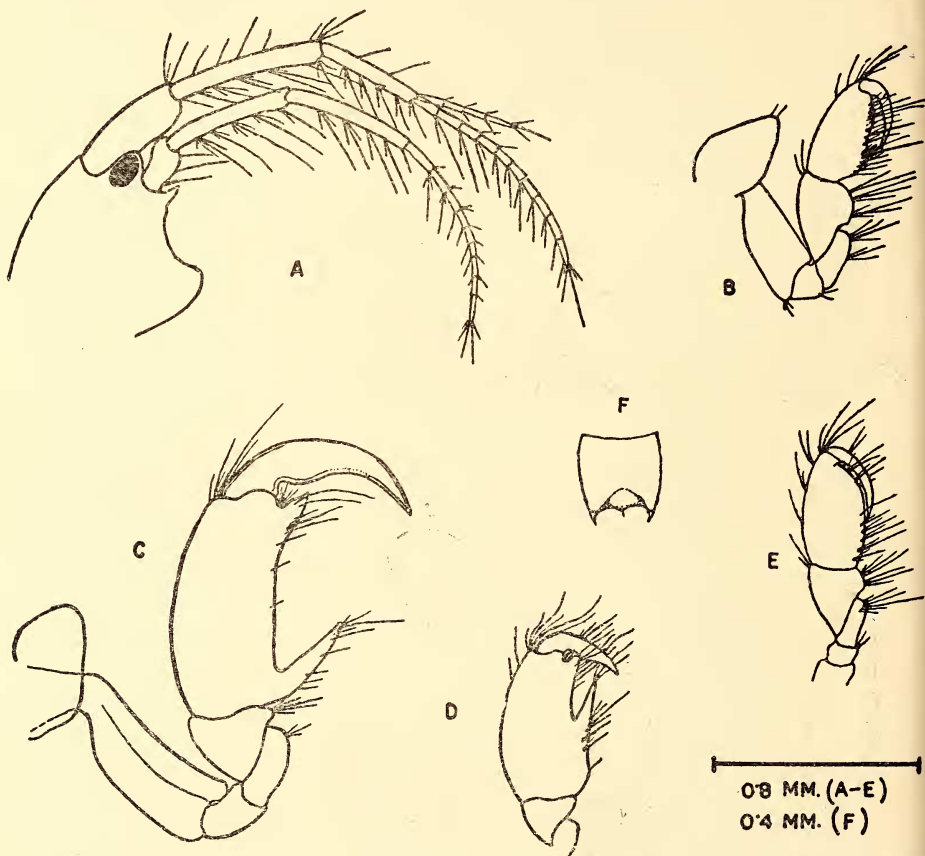


Fig. 10. *Eurystheus digitatus* Schellenberg. Male : A, head ; B, gnathopod 1 ; C, gnathopod 2 of adult ; D, gnathopod 2 of young ; F, telson. Female : E, gnathopod 2.

cess from the base of hind margin and the falcate dactylus (as in *Jassa falcata*) of gnathopod 2 of male are characteristic of this species.

Distribution : Ellice and Gilbert Islands (South Pacific Ocean). In India this species is recorded for the first time.

Eurystheus sp.

Material : Madras, Royapuram : 30 specimens from the washings of holothurians and stones.

Length : 5.5 mm.

Remarks : The author is unable to identify these specimens for want of sufficient literature. They have the following features : Ocular lobes well-developed, acute in front. Eyes dark, oblong, Antennae fringed with long setae on lower margin. Antenna 1 : Flagellum shorter than peduncle, with 9-10 joints. Accessory flagellum 4-jointed. Antenna 2 : Flagellum with 9-10 joints, shorter than peduncle. Mouth parts typical of the genus. Gnathopod 1 of male : 6th joint oblong, palm about half as long as front margin, slightly oblique and convex. Dactylus slender, serrate on inner margin. Gnathopod 2 of male : Almost naked. 4th joint produced distally and partly encircling base of 6th joint. 5th joint triangular, not produced behind between 4th and 6th joints. 6th joint large, widest at the base, narrowing distally. Palm narrow, with a tubercular prominence near hinge of dactylus followed by a long, very oblique, concave part and defined posteriorly by a small, pointed tooth produced distally from hind margin. Hind margin $\frac{1}{3}$ as long as front, with 2 setiferous notches distally. Dactylus large, falcate, its tip impinging the corner tooth of palm. Gnathopod 1 of female as in male. Gnathopod 2 of female : Hind lobe of 5th joint rounded, setose. 6th joint setose, palm oblique, wavy, with an anterior convex portion and defined by a stout spine. Dactylus serrate on inner margin. Peraeopods and uropods typical of the genus. Telson semicylindrical, hollowed out posteriorly and produced medianly below into an acute lobe. Lateral angles each with a spine and a seta.

Family AMPITHOIDAE

Genus *Ampithoe* Leach***Ampithoe ramondi*** Audouin

(Fig. 11)

Ampithoe ramondi Audouin, 1826, p. 93, pl. 11, fig. 6 ; Schellenberg, 1936, p. 19, 1938 (a), p. 87 ; Ruffo, 1938 (a), p. 146.

Ampithoe ramondi Bate, 1862, p. 239, pl. 42, fig. 1 ; Schellenberg, 1928, p. 665 ; Barnard KH, 1935, p. 305, 1937, p. 170 ; 1940, p. 480 ; 1955, p. 7 ; Pirlot, 1938, p. 346 ; Shoemaker, 1942, p. 40 ; Barnard JL, 1955, p. 28.

Ampithoe vaillantii Chevreux, 1901, p. 418 ; 1911, p. 26, pl. 20, figs. 1-4 ; Walker, 1904, p. 291 ; Chevreux & Fage, 1925, p. 333, fig. 341-342 ; Crawford, 1936, p. 104 Reid, 1951, p. 264.

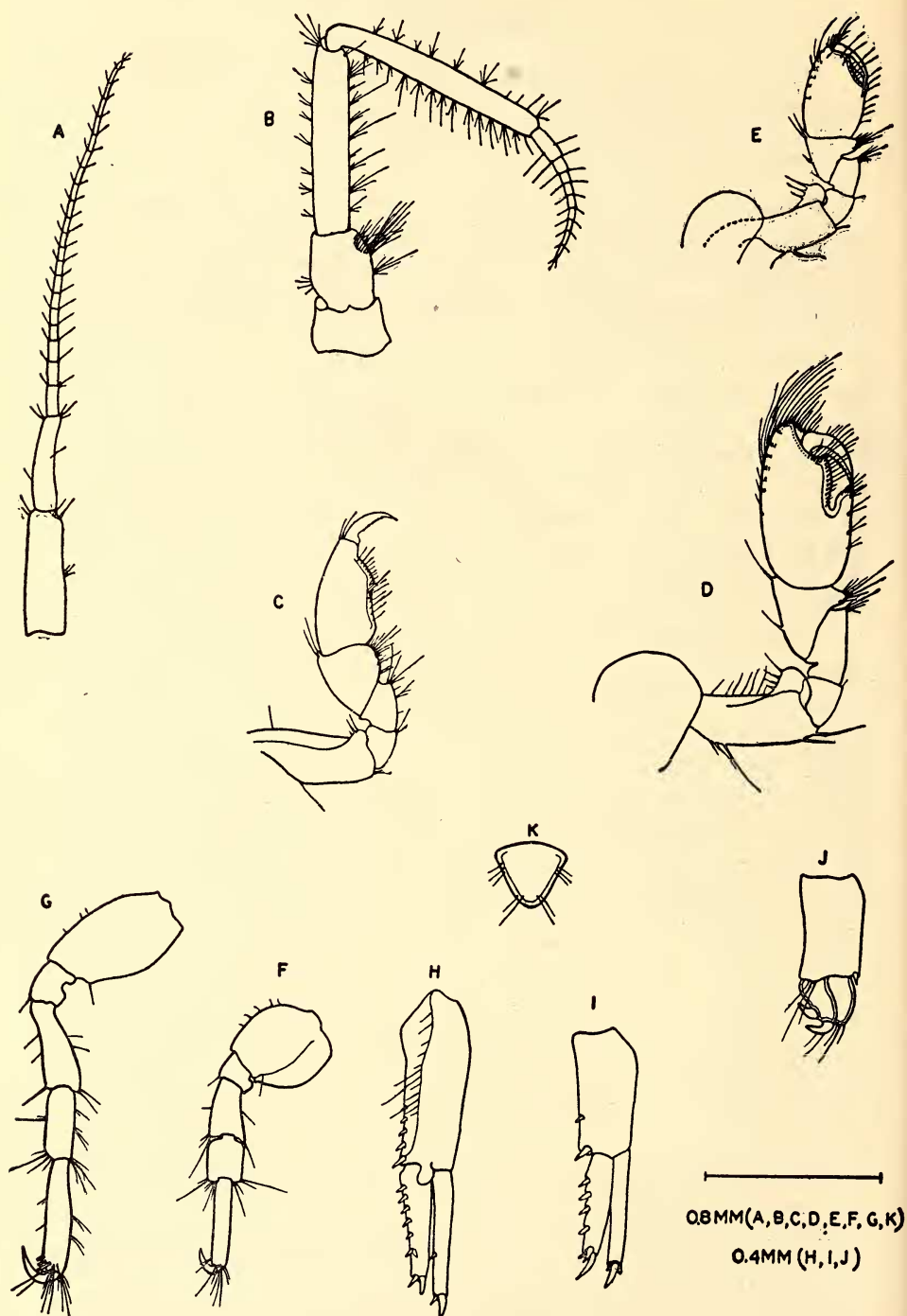


Fig. 11. *Ampithoe ramondi* Audouin. Male : A, antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2; E, gnathopod 3; F, peraeopod 3; G, peraeopod 5; H, uropod 1; I, uropod 2; J, uropod 3; K, telson. Female : E, gnathopod 2.

Ampithoe vaillantii Bate, 1862, p. 245, pl. 42, fig. 6 ; Stephensen, 1915, p. 51 ; Barnard KH, 1916, p. 253.

Ampithoe divisura Shoemaker, 1933, p. 255, fig. 9.

Ampithoe intermedia Walker, 1904, p. 290, pl. 7, fig. 46 ; 1905, p. 931 ; 1909, p. 341 ; 1916, p. 346 ; Chevreux 1908, p. 515, fig. 29 ; Shoemaker, 1921, p. 102.

Ampithoe intermedia Stebbing, 1906, p. 738 ; 1910, p. 462.

Ampithoe lobata Walker, 1909, p. 342, pl. 43, fig. 9.

Material : Pamban : 3 males and 1 male from seaweeds.

Length : 5 mm.

Remarks : The 2nd gnathopod of male in this species is subject to considerable variation in shape and this has led to the rather long list of synonymy.

The present material closely agrees with Walker's (1904) description of *A. intermedia* which has been synonymised with the present species. A large male (5 mm.) was a little different in the structure of antennae and the gnathopods. Body and appendages with small rounded cuticular thickenings. 4th and 5th joints of peduncle of antenna 2 rather elongated ; flagellum shorter, $\frac{2}{3}$ as long as 5th joint. Gnathopod 1 : Front margin of 2nd joint with a small distal lobe ; 6th joint much longer, $1\frac{1}{2}$ times as long as 5th, hind margin slightly concave, continuous with the narrow palm and granular in appearance. Gnathopod 2 : Front margin of joint 2 distally produced into a large humplike process ; 6th joint longer, twice as long as 5th, the palmar cleft U-shaped rather than V-shaped.

Distribution : Cosmopolitan in tropical and subtropical seas.

Genus *Cymadusa* Savigny

Cymadusa microphthalma (Chevreux)

(Fig. 12)

Grubia microphthalma Chevreux, 1901, p. 422, figs. 46-49 ; Walker, 1905, p. 930, fig. 142 & pl. 88, fig. 15 ; Stebbing, 1906, p. 738.

Material : Cape Comorin : 3 females from algae. Kilakkarai : 1 male and 6 females from algae. Devipattinam : 1 female from sponges. Nambuthalai : 1 male from algae.

Length : 10 mm.

Description : Male : Head as long as first two segments. Eyes very small, oval, colourless in spirit (was probably red in life). Body smooth, with grey or violet patches and dots all over. 1st segment is the shortest, 3rd pleosome longest. Side plates large, oblong, smoothly rounded.

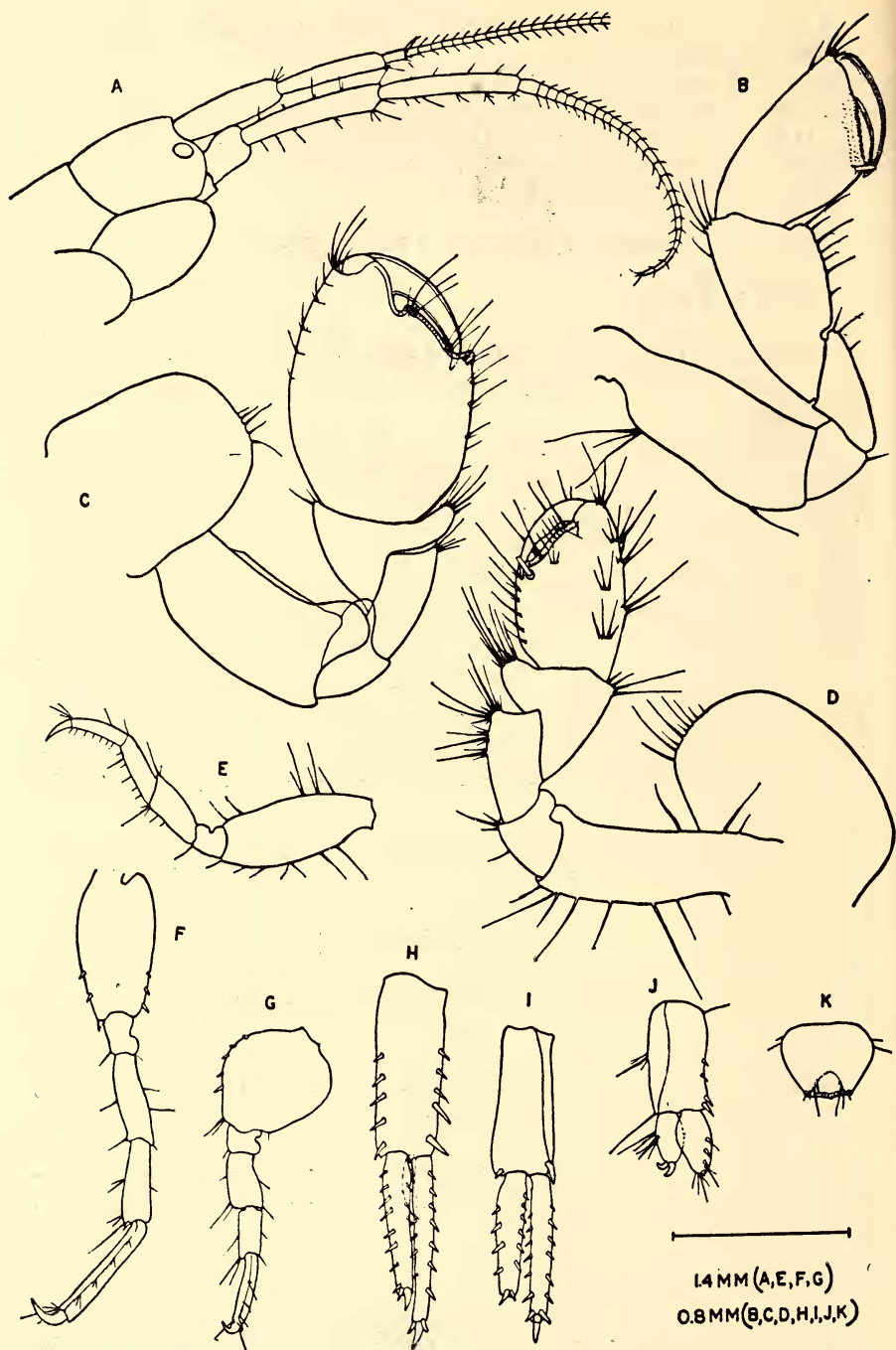


FIG. 12. *Cymadusa microphthalmalma* (Chevreux). Male : A, head ; B, gnathopod 1 ; C, gnathopod 2 ; E, peraeopod 1 ; F, peraeopod 5 ; G, peraeopod 3 ; H, uropod 1 ; I, uropod 2 ; J, uropod 3 ; K, telson. Female : D, gnathopod 2.